

J2ME OGC WMS Client user manual

Version 1.1.0



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1 Introduction

1.1 Features

The WMS Client has the following features:

- The WMS Client is conform to the OGC WMS 1.1.0 / 1.1.1 specifications
- Loading of OGC WMS given the service URL
- Zoom and pan within the map
- Usage of WMS sublayers of one service
- Bookmark management for easy and fast service-access
- Runs on every Java (MIDP1.0/CLDC1.0) enabled mobile phone and PDA

1.2 Web Services

Mobile IT applications are usually distributed applications, that consist of different components running in various places. Such components are services. If it is possible to connect to this services over the Internet via the HTTP protocol, they are called Web Services.

1.3 Web Mapping

A Web Map Service (WMS) is a service which produces georeferenced image maps of geographical data. By sourcing the processing levels like data query and image rendering out into the client, it is possible to create fast and memory-efficient clients like the J2ME OGC WMS Client.

2 Installation

2.1 Devices

Because of the MIDP1.0/CLDC1.0 conform implementation of the WMS Clients, the program can be used on a broad spectrum of devices. Old Java-enabled mobile phones, smartphones or high-end PDA's can be used. Due to this diversity the installation process is different depending on the device.

2.2 Requirements

The WMS Client runs on every MIDP1.0/CLDC1.0 compatible mobile phone, PDA or smartphone. MIDP1.0/CLDC1.0 is the first J2ME standard, so it will run on virtually every Java-enabled mobile phone. Additionally the device needs a working network connection to use WMS servers. In most cases this will be GPRS, UMTS or IEEE802.11 (WLAN).

2.3 OTA Installation

Using OTA installation, the WMS Client can be downloaded via Internet on to the device and installed directly. This is the easiest method to install the WMS Client on a mobile phone or PocketPC- / Palm- PDA. OTA is supported by many devices but not all. The device needs a working internet connection. You can use a WAP-browser or a microbrowser to access the download website of the WMS Client and install it directly.

The OTA download-link for the most recent version of the WMS Client can be found here:

<http://micro.skylab-mobilesystems.com>

the URL of the file itself:

<http://micro.skylab-mobilesystems.com/wmsclient.jar>

2.4 Manual Installation

Doing a manual installation you have to copy the WMS Client via cable, Bluetooth or IRDA to the device. You have to deflate the zip-archive and copy the .jar and sometimes also the .jad file. The client is in the file `wmsclient.jar`. Some devices also need an archive description which is in the additional `wmsclient.jad` file.

2.5 Installation on old Palm PDA's

For Palm PDA's there are two common J2ME environments. The MIDP4Palm environment from Sun Microsystems runs on every Palm PDA, in particular also on old 68K-Palm PDA's. The installation of the WMS Client for this Java environment differs a bit from the installation on mobile phones or modern PDA's. It is not possible to install .jar files directly. They have to be converted in a special format to be installable like any other program with the Palm Desktop. The conversion utility is available for free. There is however a converted version available from the Skylab Mobilesystems homepage. The Palm operatingsystem has no J2ME support included, so an external Java environment has to be installed. It is available for free at this website:

<http://java.sun.com/products/midp4palm/download.html>

3 Usage

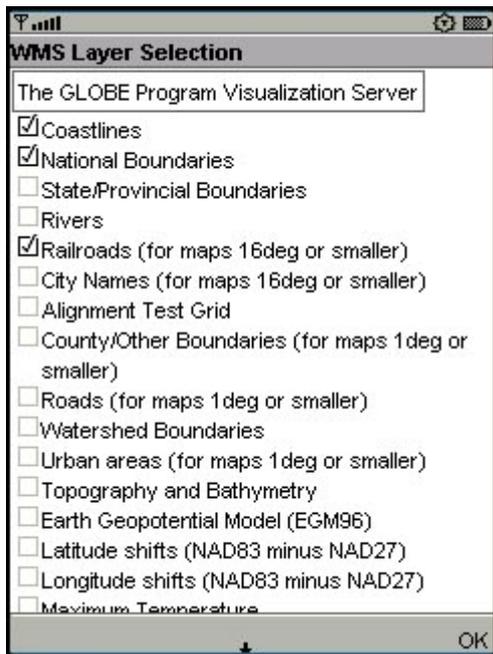
3.1 Query of a new OGC WMS

To query a new OGC WMS the URL of the Capabilities document is needed. If you are not sure if it is a valid URL, you can test it in any web browser and should see the Capabilities XML document.

A typical Capabilities URL looks like this:

`http://demo/WSServlet?VERSION=1.1.0&REQUEST=GetCapabilities&SERVICE=WMS`

After confirming the Capabilities URL a connection to the server will be established and the server information will be downloaded and computed. This may take some seconds. When finished, you get an overview of all available layers:



At least one layer has to be selected. After confirming the layer selection you will see the map in which you can navigate.

3.2 Bookmark usage

The input of an URL, that is needed to configure a WMS, is usually not very comfortable on mobile devices. To solve this problem, the WMS Client provides a bookmark manager. Bookmarks will be stored in the non-volatile memory of the device.

3.3 Navigation in the map



There are two modes for map navigation: **zoom** and **pan**. Using the **pan**-mode you can move in the map with the four arrow keys. Using the **zoom**-mode you can zoom in with the "arrow up"-key or zoom out with the "arrow down"-key. The mode can be changed pressing the center key. The current mode is displayed in the upper right corner.

3.4 Configuration

All important settings can be set in the menu - "**Settings**". The following settings are available:

Zoom %: zoom level in percent

Move %: pan/move level in percent

Show Position: select if the coordinate of the cursor should be shown/hidden

Show Marker: select if the cursor-cross should be shown/hidden

3.5 Key Configuration

Some devices might have a different key-layout than the default one. You can change the key mappings, which are needed for navigation in the map, as you like. Press the key you want to use for the displayed action. After that a numeric code of the key will appear on the display. Press "next key" and set up all keys. When all keys have been set, the program goes back to the main menu.

4 Troubleshooting

4.1 Restrictions of the Client

The WMS Client is resourcefriendly implemented. According to the OGC WMS specifications, a Capabilities document can be arbitrary long. This can lead to problems with the available device-memory. During testing this problem appeared on the MIDP4Palm environment which restricts the memory usage to 64kb, so that very long Capabilities documents could not be loaded.

Currently the WMS Client only supports map images in PNG format. Although most of the WMS Servers provide this format, there might be servers which do not support PNG and therefore can not be used.

The MIDP1.0/CLDC1.0 specification requires a minimum display resolution of 96 x 54 pixels. If you are using the WMS Client on a device with a very low resolution the map display might be badly visible because most of the mapservers do not optimize the output for mobile clients. In particular cases the map server denies to create a map in a low resolution. This server can not be used.

The client only supports the spatial reference system EPSG:4326 (WGS84), which should, according to the OGC WMS specification, be supported by every WMS.

4.2 Possible error messages

java.lang.SecurityException: Application not authorised to access the restricted API

The WMS Client has to establish a network connection to the server. Depending on your network this might lead to expenses. Because of that you have to allow the WMS Client to establish a network connection. To see how to do this please consult the user manual of your device or the used Java environment.

java.mciroedition.io.ConnectionNotFoundException: TCP open

An incorrect or not connectable URL was entered. Please check the URL and your network configuration.

java.lang.IllegalArgumentException: no ':' in URL

The syntax of the entered URL is incorrect. This is an example for a valid Capabilities URL:

```
http://demo/WMServlet?VERSION=1.1.0&REQUEST=GetCapabilities&SERVICE=WMS
```

WMSError:

A "WMSError" is an error generated by the WMS Server. It can differ from server to server but is usually explained in plain text.

4.3 FAQ

A connection to the server can not be established.

Please check your network configuration. If you are using a GPRS connection, check if the GPRS data profile is activated. Often the WAP-profile is enabled by default.

After quering a WMS a white picture is displayed, not a map.

Some services display the map data only in a certain scale. The WMS Client uses the maximum bounding box of all selected layers for the first map image. If this initial bounding box is not in the right scale, a white image can appear. After zooming in, the scale will change too and you will see the map image after the right scale range is reached.

5 License

The J2ME OGC WMS Client is intended as a technology demonstration and is free for non commercial use. If you want to use the software for any other purpose like presentation of OGC possibilities on exhibitions or similar as well as any kind of commercial application please write to: info@skylab-mobilesystems.com

Symbolverzeichnis

CLDC	CLDC - Connected Limited Device Configuration; a standard developed by Sun for small devices
GPRS	General Packet Radio Service is a radio technology for GSM networks that adds packet-switching protocols. It enables high-speed wireless Internet and other data communications.
J2ME	Java 2 Micro Edition. For Java enabled devices like mobile phones and PDA's
Java	Java is programming language developed by Sun Microsystems to develop platform independent software.
MIDlet	A MIDlet is a Java program which can be used on small devices under the J2ME environment
MIDP	the Mobile Information Device Profile is a J2ME profile
OGC	Open GIS Consortium: The Open Geospatial Consortium, Inc. is a non-profit, international, voluntary consensus standards organization that is leading the development of standards for geospatial and location based services.
OTA	Over The Air (OTA) refers to any wireless networking technology.
PDA	Personal Digital Assistant: hand held computer, often without keyboard.
PocketPC	PocketPC is a class of high end PDAs and the name of an operation system from Microsoft which is based on Windows CE
SRS	Spatial Reference System
UMTS	Universal Mobile Telecommunications System - The 3G mobile telephone standard in Europe. It supports a theoretical data throughput of up to 2 Mbps.
URL	Uniform Resource Locator